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# CROATIAN PUPILS' PERSPECTIVES ON REMOTE TEACHING AND LEARNING DURING THE COVID-19 PANDEMIC

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On March 16th 2020, the Croatian government mandated a nationwide closure of schools and introduced remote teaching and learning in response to the COVID-19 pandemic. The present study explores the perspectives of pupils in the 7th grade of elementary education regarding this period of remote teaching and learning. The study aims to examine the level and determinants of pupils' satisfaction with newly implemented practices and to explore their perception of remote teaching and learning in comparison to classroom practices. An online survey was conducted with 920 pupils from 23 elementary schools in Zagreb between May 25th and June 6th 2020. The results indicate average satisfaction levels and a weak ability of the model to predict pupils' satisfaction based on a set of individual pupil characteristics. Pupils' interest in using digital devices and fathers' educational status were the only significant predictors of satisfaction. On average, pupils perceived remote teaching and learning as unfavourable in terms of quality, task load and effort in comparison to classroom practices. There was, however, a small cluster of pupils (15%) who associated remote teaching and learning with higher-quality practices.

**Keywords:** comparison of classroom and remote teaching and learning, pupils' satisfaction with remote teaching and learning, education during the COVID-19 pandemic, lower secondary education



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## INTRODUCTION

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The COVID-19 pandemic represents the greatest global disruption of the educational process in recent history, impacting over 1.6 billion students at various educational levels from 190 countries (UN, 2020). The negative effects of the pandemic on educational processes were manifested in the intensification of already present inequalities between and within education systems and in the significant learning losses and disruptions in students' educational journeys (OECD, 2020; Di Pietro et al., 2020). Evidence indicates that the education systems of low and lower-middle income countries were more greatly impacted (UN, 2020). In all the systems, opportunities for those at risk or with special education needs were either significantly altered or disappeared completely in terms of both the quantity and quality of learning experiences (Haeck & Lefebvre, 2020). However, responses of educational authorities and practitioners also resulted in many positive features by opening a space for innovation and creativity within the formal educational context (OECD, 2020). Furthermore, the situation demonstrated the flexibility of educational structures, a feature not often associated with robust and inert systems.

In response to this disruption, most educational systems introduced some form of remote teaching and learning in an aim to ensure the continuation of the educational process (Reimers & Schleicher, 2020). This introduction represents a unique historical situation in which primary and secondary education cohorts experienced non-classroom teaching and learning for an extended period of time. As such, it is of vital importance to use this opportunity to scientifically explore pupils' perspectives on remote teaching and learning and how they compare this sudden experience with that which they were accustomed to in classrooms. On March 16th 2020, the Croatian government mandated a nationwide closure of educational institutions as one of several public health measures, while at the same time introducing a set of policy measures that moved educational processes from the classroom to remote teaching and learning (MSE, 2020).

### **The Croatian response to the Covid-19 pandemic in education**

Specific sets of policy solutions were introduced at three different education levels: primary (1st to 4th grade of single structure elementary education – class teaching), lower secondary (5th to 8th grade of single structure elementary education – subject teaching) and upper secondary education (all forms of VET and gymnasium education). At each educational level, these solutions entailed the use of various ICT tools

ranging from online chat groups to virtual classrooms as well as the use of more traditional forms of remote teaching and learning, such as television schooling. The diversity in solutions was further reflected in vast differences in the degree of standardisation to which these tools were implemented at the single school and national levels. Specifically, the implemented solutions elicited diverse expectations in relation to the forms and intensity of communication between pupils and teachers, which ranged from minute-to-minute communication to no obligation for communication whatsoever. All of the aforementioned significantly altered the roles of educational workers. Furthermore, remote teaching and learning solutions elicited different levels of parental involvement and expected greater levels of pupil self-regulation. This in turn likely exerted a strong influence on the overall experience of education, roles within the educational process and general well-being for all educational stakeholders – pupils, teachers, school staff and parents. Whereas pupils at the ISCED 1 level (1st to 4th grade) returned to classrooms in May 2020, those at the ISCED 2 level (5th to 8th grade) remained in the remote teaching and learning environment for the duration of the academic year 2019/20. These cohorts represent the first generations of elementary education pupils in Croatia experiencing full remote teaching and learning in formal education. Table 1 further describes the various elements of the remote teaching and learning process applied in lower secondary education (ISCED 2) in Croatia.

Prior to the COVID-19 pandemic, the Croatian education system did not include the systemic, universal use of ICT at ISCED levels 1-3. The PISA 2018 results indicate a scarcity of digital devices and tools in schools and infrequent use by pupils in general and for the purpose of enhancing the teaching and learning process especially (Markočić Dekanić et al., 2019). In contrast, Croatian pupils reported levels of at-home access to computers and internet that are higher than the OECD average (OECD, 2015). Efforts aimed at the systemic digitalisation of the Croatian education system started in 2015 with the pilot project *E-schools: Inception of a system for developing digitally mature schools*, followed by a full-scale project aimed at all educational institutions launched in 2020 (CARNET, 2020). Empirical evaluation of the pilot project suggests limited positive effects of the introduction of ICT, including the use of tablet technology and digital materials (CPPFFRI, 2018). More specifically, pupils reported an almost negligent increase in participation in ICT activities related to school and school tasks, as compared to prior to the project. Even more surprisingly, pupils' perceived advantages of the use of ICT in teach-

ing and learning significantly decreased at the end of the pilot project, while the perceived disadvantages did not significantly change. Furthermore, both extrinsic and intrinsic goal orientation for learning declined following the project. These results indicated a potential for the use of ICT in ameliorating the teaching and learning process, especially in light of the results indicating high levels of access to digital technology in pupils' homes.

**TABLE 1**  
Elements of the  
educational response  
in Croatia (ISCED 2  
level)

Element	Lower secondary (ISCED 2)
Remote teaching and learning solutions	VIRTUAL CLASSROOMS + TV/YOUTUBE LESSONS (all subjects) Virtual platforms where head-teachers were assigned the task of creating and organising a 'virtual classroom' consisting of all pupils and subject teachers teaching in a particular class. All tasks were assigned to pupils through virtual classrooms. In addition, lessons following the official curricula were broadcast on commercial TV channels and are available on YouTube.
Technical requirements	Personal computer or tablet and high-speed internet. Individual tablets were provided by the state to all 5th and 7th grade pupils. Other cohorts were not provided with devices by the state. Some families and teachers were provided with personal computers by individual schools.
Standardisation of teaching and learning experiences and assessment practices	Decisions regarding the platform for virtual classrooms were made at the level of each school. There was a lack of standardisation within individual schools, where tasks and activities for each subject were created and delivered by individual teachers. TV programming did not address the diversity of situations in different classes at the onset of the disruption and was not proclaimed as obligatory.
Pupil-teacher communication	Direct communication via class-level virtual classroom, implemented on the ICT platform chosen by the individual school. Teaching and learning requirements communicated directly to pupils and not to parents. Inconsistent communication practices within schools and large differences in practices between schools.
Expected level of pupil self-regulation	Very high
Role of teachers	Altered due to the use of ICT tools
Expected ICT competence	Pupils – high Teachers – high
Parental involvement	Moderate and heterogeneous, dependent on strategies adopted by teachers and parents.
Expected socio-economic impact	High. Great diversity across families with regard to the availability of computer equipment and high-speed internet. Diversity of familial situations with regard to facilitating and supporting learning.

One of the important elements of the Croatian ICT policy solutions at the ISCED 2 level was that all the 5th and 7th grade pupils were provided with Android tablets. Previous research examining pupils' attitudes towards ICT with regard to the use of tablets in classroom teaching and learning indicated generally positive attitudes, especially among those who had an opportunity to use this technology (Rončević Zubković et al., 2016). These generally positive attitudes towards

the use of tablets are also evident in the results of methodologically and theoretically diverse research efforts in the international context (Mulet et al., 2019). Furthermore, Clarke and Svanaes (2014) suggest that the use of tablets facilitates development of important generic competences such as communication and collaboration between pupils. In their review of evidence of the use of tablets on learning outcomes, Haßler et al. (2016) found a positive relationship in 16 out of 23 reviewed studies. Overall, the generally positive attitudes of pupils towards the use of tablets in learning and the positive effects of tablet use on learning outcomes and cooperation suggest that tablet technology could be particularly efficient in the context of remote teaching and learning. While the findings of the research presented above have informed the present study, the disruption of the education process and policy responses as a result of the pandemic represent a unique research setting that requires exploration.

## **AIMS OF THE RESEARCH**

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National-level guidelines provided by the Ministry of Education (MSE, 2020) established a general framework for action and introduced various online platforms, tools and services, while also allowing schools to respond to the challenging situation in an individualised manner that took into consideration existing resources and the competences and needs of pupils, teachers and other school personnel. While this reaction at the Ministry and school levels ensured the continuity of the educational process, many questions and concerns were raised in both the general public and expert communities regarding the quality of the remote teaching and learning solutions. In light of these complex and intertwined circumstances, the scientific exploration of pupils' reactions to this situation is an important and relevant endeavour.

As such, the present paper aims to answer the following questions:

1. To what extent are pupils satisfied with the remote teaching and learning practices during the COVID-19 pandemic and what are the factors that predict pupil satisfaction?
2. What are pupils' perspectives on features associated with the quality of education offered in the remote teaching and learning during the COVID-19 pandemic, as compared to classroom teaching and learning?
3. What are the pupil profiles based on response patterns comparing remote and classroom teaching and learning?

Findings arising from this study might be useful for improving processes of remote teaching and learning, comple-

menting classroom practices and, perhaps most significantly, in the development of hybrid models as a more preferable solution in future crisis situations.

## **METHOD**

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This paper presents the results of an online survey conducted with 7th grade pupils between May 25th and June 6th 2020, a period in which the entire educational process had shifted from the classroom to remote teaching and learning as a result of the COVID-19 pandemic. The survey represents the 5th data collection wave of a larger, longitudinal, mixed model research project examining pupils' educational aspirations. This project follows the same generation of elementary school pupils from the academic year 2016/17 to the present.

### **Participants**

The survey was conducted in 23 elementary schools in the City of Zagreb, Croatia, representing a sample of 21.9% of all public elementary schools in the area. The selected schools constituted a random sample stratified by school location. In each school, at least two 7th grade classes were randomly selected for participation and all the students from these classes were invited to participate. Parents of all pupils participating in the survey provided informed written consent prior to administration of the questionnaire in the first wave.

In total, 920 7th grade pupils participated in the survey and their responses are included in statistical analyses presented in this paper. The response rate, calculated as the proportion of pupils participating in the present survey from the number of all pupils participating in the 1st wave of the research, was 86.6%.

The sample consisted of nearly equal numbers of male (51.4%) and female (48.6%) pupils. The age of the participants was between 13.5 and 14.5.

### **Measures and procedures**

The pupil questionnaire was applied online via the Gizmo Survey platform at the end of the second semester of 7th grade, approximately 2.5 months after the introduction of remote teaching and learning. Application of the questionnaire was conducted in cooperation with schools, where links to the survey were sent to all participating pupils via e-mail or online platforms used in schools during the lockdown period. During the two-week data collection period, pupils were invited and reminded to participate in the survey at least twice by the school staff.

The questionnaire included scales developed specifically to address the aims of this paper as well as a number of scales

related to the aims of the larger study of educational aspirations. For the purpose of the present paper, the following parts of the questionnaire were of interest:

### **Satisfaction with remote teaching and learning**

Pupils' satisfaction with remote teaching and learning was measured using a single item: *Generally speaking, how satisfied are you with remote teaching and learning?* Responses were given on a 5-point scale: 1 – *Highly dissatisfied*, 2 – *Dissatisfied*, 3 – *Neither satisfied, nor dissatisfied*, 4 – *Satisfied* and 5 – *Highly satisfied*.

### **Pupils' direct comparison of remote and classroom teaching and learning**

In order to measure how pupils compare remote to regular classroom teaching and learning, a new scale was constructed. The scale consisted of 10 items developed to encompass various features of a high-quality teaching and learning process: comprehensiveness, clarity, ability to raise pupils' interest in the subject, good teacher-pupil relationship, regular feedback, adjustment to individual needs, encouragement of higher-order cognitive processes, fairness and appropriate level of demand in school assignments.

For each feature, pupils were asked to provide responses to the general question: *Since mid-March, teaching and learning has been transferred from classrooms to the online environment. Please compare whether the following applies more to classroom or remote teaching and learning.*

Possible responses were: Applies much more to *classroom* teaching and learning; Applies more to *classroom* teaching and learning; Applies equally to *classroom* and *remote* teaching and learning; Applies more to *remote* teaching and learning; Applies much more to *remote* teaching and learning

A principal axis factor analysis was conducted with varimax rotation. Bartlett's test of sphericity ( $\chi^2(45) = 2206.11, p < 0.001$ ) and the Kaiser-Meyer-Olkin measure ( $KMO = 0.86$ ) verified the sampling adequacy for the analysis. KMO values for individual items were above the acceptable limit of 0.5. The results of an orthogonal rotation of the solution are presented in Table 2. The analysis yielded a two-factor solution with a simple structure explaining a total of 51.52% of the variance for the entire set of variables (loadings less than 0.3 were excluded). Factor 1 (explaining 31.20% of the variance) was labelled "The quality of teaching and learning" due to high loadings by items representing various characteristics of the teaching and learning process (comprehensibility, clarity, fairness, quality of relationship, etc.). Factor 2 (explaining 14.32% of the variance) was labelled "School task load and ef-

TABLE 2  
Results from a Factor Analysis (principal component analysis with varimax rotation) of 10 items regarding pupils' direct comparison of classroom and remote teaching and learning

fort", on which two items clustered: *Completing school assignments requires a lot of effort* and *We get many school assignments to complete in a short time*. The reliability measure ( $\alpha = 0.57$ ) was somewhat moderate. However, as factor 2 was formulated based on only two items, it was judged appropriate to include it in subsequent analytical procedures as the initial measurement of pupils' perception of task load and effort. Future studies should include additional items probing this factor.

Item	Factor loadings after rotation		Communalities
	1	2	
Factor 1: The quality of teaching and learning			
The subject content is presented in a way that we can understand.	0.77		0.611
We can get additional explanations from the teacher if something is not clear to us.	0.73		0.531
We have good relationships with teachers.	0.70		0.495
Teachers encourage us to learn with understanding.	0.69		0.487
Teachers give clear instructions for school assignments.	0.67		0.471
We get the grades we deserve.	0.66		0.442
We receive feedback from teachers on a regular and timely basis.	0.62		0.404
The subject content we learn is presented in an interesting way.	0.56		0.328
Factor 2: School task load and effort			
Completing school assignments requires a lot of effort.		0.83	0.699
We get many school assignments to complete in a short time.		0.82	0.685
Eigen value	3.720	1.432	
Percentage of total variance	37.20	14.32	
Cronbach Alpha	0.83	0.57	

Note: Factor loadings above 0.30 are shown.

For each pupil, factor scores were calculated as the average of the pupil's results on items belonging to a given factor.

### Interest in using digital devices

Pupils' interest in using digital devices was measured using a single item: *I like using digital devices*. Pupils responded on a 5-point Likert scale ranging from 1 – *completely disagree* to 5 – *completely agree*. The mean value on this item was 4.31 ( $SD = 0.872$ ).

### Perceived competence in using digital devices

In order to measure perceived competence in using digital devices, pupils were asked to indicate their level of agreement with the item: *I use digital devices with ease*. Answers were again provided on a 5-point Likert-type scale ranging from 1 – *completely disagree* to 5 – *completely agree*. The mean value on this item was 4.46 ( $SD = 0.794$ ).



### Expected grade point average at the end of 7th grade

Pupils were asked to express their expectations with regard to school achievement by estimating their expected grade point average (GPA) at the end of 7th grade. While the original variable had seven categories (2.01 – 2.50; 2.51 – 3.00; 3.01 – 3.50; 3.51 – 4.00; 4.01 – 4.50; 4.50 – 4.99 and 5.00), this variable was recoded in light of the small incidences of cases in the lowest categories. The recoded variable had four categories: up to 4.0 (18.3% of cases), 4.01 – 4.50 (23.0%), 4.51 – 4.99 (36.6%) and 5.00 (22.0%).

### Educational status of father

Information about maternal and paternal educational status was collected in the third wave of data collection (when pupils were nearing the end of 5th grade). Possible responses on the items regarding parental educational status were: *finished elementary education*, *finished secondary education* and *finished higher education*. For the purpose of the analysis, only data regarding fathers' educational status were used because a higher level of variation was observed in these responses than among those for mothers. A total of 133 (14.4%) missing cases were observed (NA, DK answers). This variable was recoded as binary due to the low incidence of cases in the category *finished elementary education*, which was merged with the middle category (*finished secondary education*). In the sample of valid cases, the fathers of 64.5% pupils finished higher education, while fathers of 35.5% of pupils had a lower education level.

## RESULTS

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The first part of this section describes the pupils' level of satisfaction with remote teaching and learning and presents the results of regression analysis, which models whether satisfaction ratings could be predicted based on a set of individual and social characteristics of pupils. The second part of this section examines pupils' comparison of remote and classroom teaching and learning and presents the results of cluster analysis used for the identification and description of distinct pupil profiles based on response patterns when comparing classroom and remote practices.

### Satisfaction with remote teaching and learning

The data regarding pupils' satisfaction with remote teaching and learning indicate that the middle category – *Neither satisfied, nor dissatisfied* – was chosen by the highest percentage of pupils (28.4%). In total, 41.2% pupils were satisfied (15.2% highly) and 30.4% dissatisfied (12.7% highly). The mean score was 3.13 ( $SD = 1.240$ ).<sup>1</sup>

TABLE 3  
Results of multiple  
regression analysis for  
variables predicting  
satisfaction with  
remote teaching and  
learning

Multiple regression analysis was used to test whether a number of individual pupil characteristics and social background significantly predicted ratings of satisfaction with remote teaching and learning. These predictors were: gender, expected school achievement at the end of 7th grade, interest and perceived competence in using digital devices and father's educational status. Because all predictors used in the analysis were categorical, they were recoded and treated as dummy variables. The results of the regression (Table 3) indicated that the five predictors explained only 3.4% of the variance ( $R^2 = 0.034$ ,  $F(9,749) = 2.90$ ,  $p < 0.01$ ). Gender, pupils' expected school achievement and perceived competence in using digital devices were not found to be significant predictors of satisfaction with remote teaching and learning. Father's educational status significantly predicted pupils' satisfaction ratings ( $\beta = 0.08$ ,  $p < 0.05$ ), as did interest in using digital devices ( $\beta_{\text{moderate}} = 0.11$ ,  $p < 0.05$ ;  $\beta_{\text{high}} = 0.15$ ,  $p < 0.05$ ).

		Estimate	SE	$\beta$	$p$
Constant		2.629	0.198		0.000
Educational status of father	(1-Completed higher education, 0-Completed upper-secondary education or below)	0.208	0.096	0.081	0.031
Gender	(1 = Female, 0 = Male)	0.085	0.092	0.034	0.357
GPA	Up to 4.00 versus 5.00	-0.216	0.148	-0.067	0.145
	4.01-4.50 versus 5.00	-0.205	0.137	-0.069	0.137
	4.51 versus 5.00	-0.050	0.122	-0.019	0.680
Interest in using digital devices	Moderate versus low	0.286	0.144	0.108	0.048
	High versus low	0.376	0.153	0.152	0.014
Perceived competence in using digital devices	Moderate versus low	0.149	0.163	0.053	0.359
	High versus low	0.180	0.167	0.071	0.281
$R^2$			0.034		
$F$			2.897		
$p$			0.002		

## Pupils' comparison of remote and classroom teaching and learning

Pupils' responses to questionnaire items regarding their perception of remote teaching and learning in comparison to regular classroom practices are presented in Table 4.

For two items, *We have good relationships with teachers* and *We receive feedback from teachers on a regular and timely basis*, the dominant response was 'it applies equally to classroom and remote teaching', while all remaining response options were equally distributed between the two modes of teaching and learning. This dominance of the middle response category was

also present for another three items: *Teachers encourage us to learn with understanding*, *We get the grades we deserve* and *We can get additional explanations from the teacher if something is not clear to us*. However, for these items, the remaining responses leaned more heavily towards responses denoting that these features were more characteristic of classroom practices. This more favourable evaluation of classroom teaching and learning in comparison to remote practices was even more evident on two other items: *The subject content is presented in a way that we can understand* and *Teachers give clear instructions for school assignments*, where more than 50% of pupils claimed that these features apply more to classroom than to remote teaching and learning. A similar response pattern was also observed for the item *The subject content we learn is presented in an interesting way*, where 45.3% pupils stated that this feature is more typical for classroom teaching and learning.

TABLE 4  
Pupils' comparison of  
remote and classroom  
teaching and learning

Item (% responses)	Applies much more to classroom teaching and learning	Applies more to classroom teaching and learning	Applies equally to classroom and remote teaching and learning	Applies more to remote teaching and learning	Applies much more to remote teaching and learning
We have good relationships with teachers.	9.1	12.2	57.1	12.2	9.3
Teachers encourage us to learn with understanding.	15.4	15.9	53.2	7.3	8.2
We get the grades we deserve.	17.0	18.8	45.1	10.5	8.5
We can get additional explanations from the teacher if something is not clear to us.	17.8	21.4	42.6	9.7	8.5
We receive feedback from teachers on a regular and timely basis.	9.9	19.1	41.6	17.9	11.5
The subject content is presented in a way that we can understand.	22.2	30.4	32.0	9.7	5.7
The subject content we learn is presented in an interesting way.	20.4	24.9	30.3	16.3	8.1
Completing school assignments requires a lot of effort.	7.2	11.2	29.3	22.8	29.5
Teachers give clear instructions for school assignments.	27.3	34.5	24.2	9.5	4.5
We get many school assignments to complete in a short time.	3.8	6.8	18.1	26.6	44.6

In contrast, the items *Completing school assignments requires a lot of effort* and *We get many school assignments to complete in a*

*short time* evoked a different response among pupils, where the percentages of pupils who claimed that these features apply more to remote than to classroom teaching and learning were 52.3 and 71.2, respectively.

Overall, the mean score on the *Quality of teaching and learning factor* was  $-0.28^2$  ( $SD = 0.763$ ), indicating a slightly more favourable perception towards classroom teaching and learning than remote practices in terms of the quality of the teaching and learning process.

The mean score on the *School task load and effort factor* was  $0.79$  ( $SD = 1.000$ ), which indicates that, in general, pupils perceived remote teaching and learning to be more demanding than classroom teaching and learning.

### Pupil profiles based on response patterns in their comparison of remote and classroom teaching and learning

Pupils' mean scores on the *Quality of teaching and learning* and *School task load and effort* factors were used in a subsequent cluster analysis of the dataset. Here, the aim was to group cases into relatively homogeneous groups of pupils ("profiles") based on their perceptions of remote teaching and learning in comparison to classroom practices. The explorative procedure of Twostep cluster analysis was chosen due to its ability to cluster cases within large datasets and to automatically determine the optimal number of clusters. An analysis with 2 inputs (scores on factors 1 and 2) resulted in a model with three clusters. The Silhouette measure of cohesion and separation as a measure for the overall goodness-of-fit of the cluster structure was 0.5, indicating reasonable structure (fair cluster quality). Cluster 1 included 52.2% of cases, cluster 2: 14.9% of cases and cluster 3: 32.9% of cases, indicating that the ratio of sizes (largest to smallest cluster) is of an acceptable value (i.e. 3.50). Table 5 presents the mean scores on the *Quality of teaching and learning* and *School task load and effort* factors for all three clusters.

TABLE 5  
Mean scores and standard deviations on *Quality of teaching and learning* and *School task load and effort* factors for clusters 1, 2 and 3

	Cluster 1		Cluster 2		Cluster 3	
	M	SD	M	SD	M	SD
Factor 1: Quality of teaching and learning	-0.63	0.500	1.00	0.543	-0.31	0.552
Factor 2: School task load and effort	1.41	0.541	1.06	0.787	-0.28	0.629

An external evaluation of clusters included testing the statistical significance of differences between clusters in pupil satisfaction with remote teaching and learning implemented due to the Covid-19 pandemic (Table 6).

The relationship between cluster membership and the individual factors of gender and expected GPA at the end of 7th

grade was tested with a  $\chi^2$  test. The results of this analysis are presented in Table 7.

	Cluster 1		Cluster 2		Cluster 3					
	M	SD	M	SD	M	SD	F	df	p	Post-hoc sig.
Satisfaction with online teaching	2.81	1.198	3.56	1.229	3.47	1.168	36.98	2,875	< 0.001	Clusters 1-2 Clusters 1-3
				Cluster 1	Cluster 2	Cluster 3				
				%	%	%		$\chi^2$	df	p
Gender	Female			55.5	41.1	43.2	14.78	2	0.001	
	Male			44.5	58.9	56.8				
Expected GPA	Up to 4.00			15.3	27.7	17.4	20.05	6	0.003	
	4.01 - 4.50			23.9	27.7	23.3				
	4.51 - 4.99			36.1	32.3	36.6				
	5.0			24.7	13.2	22.7				

**TABLE 6**  
Means on *Satisfaction with remote teaching and learning* for clusters 1, 2 and 3 and Oneway ANOVA results

**TABLE 7**  
Gender and Expected GPA for clusters 1, 2 and 3, and  $\chi^2$  test results

Cluster 1, to which more than half of all participating pupils belonged, represented the largest cluster. When comparing the quality of classroom and remote teaching and learning, this group of pupils slightly favoured classroom teaching and learning to remote practices. Ratings of school task load and effort indicate that pupils in this group felt that remote teaching and learning was considerably more demanding than classroom teaching and learning. For cluster 1 pupils, the average level of satisfaction with remote teaching and learning fell in the lower part of the rating scale, indicating an overall dissatisfaction, and was lower than that found in clusters 2 and 3. An examination of the demographic profile of this cluster indicates that female pupils were overrepresented in this group (55.5%), as were pupils who expected excellent school achievement at the end of 7th grade. Within the cluster, 24.7% of pupils expected a GPA of 5.0 and a further 36.1% of pupils expected a GPA between 4.51 – 4.99, indicating that this was a group of pupils who exhibited above-average levels of school performance (but similar to cluster 3).

Cluster 2 represented the smallest proportion of all pupils (15%). It represents the group of pupils who more favourably evaluated remote teaching and learning than classroom practices in terms of the quality of the process. At the same time, these pupils recognised the higher demands associated with remote teaching and learning when compared to classroom practices (although this result was lower than that observed in cluster 1). Consistent with their positive evaluation of the quality of remote teaching and learning, these pu-

pils were predominantly satisfied with the remote teaching and learning practices implemented in their schools and had much higher satisfaction ratings than pupils in cluster 1. Examination of the demographic structure of this cluster indicates that male pupils represented the majority (58.9%). School performance of this group of pupils was lower than for pupils in the other two clusters: in cluster 2, 55.4% of pupils reported an expected GPA below 4.5 (this figure was approximately 40% in clusters 1 and 3).

Finally, cluster 3 represented one third of all participating pupils. On the whole, the position of pupils in this group was close to neutral. More specifically, when comparing classroom and remote teaching and learning, pupils in this cluster mostly indicated that each evaluated feature 'applies equally to classroom and remote teaching and learning'. As such, the mean scores on the *Quality of teaching and learning* and *School task load and effort* factors were small in value, i.e. relatively close to 0. However, the negative value of the means for both factors indicates that the pupils in cluster 3 awarded a small advantage to classroom teaching and learning over remote practices. Interestingly, pupils' satisfaction with remote teaching and learning in this group was high and similar to that observed among pupils in cluster 2. The gender composition of this group was also similar to that in cluster 2, with an overrepresentation of males (56.8%). However, indicators of school success were more positive for cluster 3 than for cluster 2 and similar to that observed in cluster 1, where most pupils in this group expected an excellent GPA at the end of 7th grade (22.7% expected 5.0 and 36.6% expected 4.51 – 4.99).

## DISCUSSION

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The findings indicate that remote teaching and learning induced mixed reactions among pupils, in which the dominant position was neutral ('neither satisfied, nor dissatisfied') and a higher proportion of pupils were satisfied (41.2%) than dissatisfied (30.4%). An examination of responses related to features of the quality of the education process reveals that remote teaching and learning was strongly associated with the perception that higher demands were placed on pupils in comparison to regular classroom practices. This is consistent with the results of two studies conducted in the same period with Croatian secondary school pupils, who also expressed concern about school workload and the number of assignments to be completed in a short time (Ristić Dedić, 2020; NCVVO, 2020). Together, these results are illustrative of the initial difficulties experienced across all levels of education in adjusting the requirements of remote teaching and learning to pupils' capacities and point to the need for better alignment and co-

operation between subject teachers in setting an appropriate level of school workload during remote teaching and learning. However, the results of the present study also indicate that the adjustment to the difficult circumstances of sudden change towards remote teaching and learning was conducted at a level deemed acceptable to pupils.

The scientific evidence suggests that key prerequisites for a successful adaptation to and completion of remote teaching and learning programmes are the students' capacity for self-regulation, self-initiative and discipline, as well as internal motivation (Kearsley, 2000; Schott et al., 2003). The results of the present study could indicate that pupils had issues with the necessary self-regulation skills and experienced problems in planning, organising and managing their learning and scheduling assignments, which resulted in perceptions of overload and greater exertion of effort in completing school tasks in the remote teaching and learning setting. This would be in line with scientific evidence at the level of higher education, where examinations of the e-learning experiences of students completing online university courses indicate that students new to the e-learning process might get lost without detailed guidance from teachers (Dearnley, 2003) and require orientation courses in order to become accustomed to a nontraditional learning environment (Kember et al., 2001).

The findings of this study also indicate that, on average, pupils perceived the quality of remote teaching and learning to be somewhat lower than that experienced in the classroom. More specifically, pupils more closely associated the clarity and comprehensibility of instruction, one of the crucial features of a high-quality education process, to classroom practices than to remote teaching and learning. In addition, pupils also associated other prominent features of educational quality, such as the ability to raise pupils' interest and providing additional instruction if needed, with classroom teaching and learning. However, it is important to emphasise that in the remote teaching and learning environment pupils continued to experience a positive relationship with teachers and felt encouraged by them. Furthermore, the results indicate a limited difference in pupils' perception of assessment in remote and classroom teaching and learning environments.

This position, in which remote teaching and learning was perceived to be somewhat less adequate than classroom teaching in terms of quality and demands placed on pupils, was embraced by the majority of participants (52.2%). This group expressed the lowest levels of satisfaction with the remote teaching and learning processes implemented in their schools. A second, smaller group of more satisfied pupils (14.9%) was composed mainly of boys and pupils with lower school

achievement. Pupils in this group felt that, although the demands associated with remote teaching and learning were high, this mode of education also possessed features of educational quality not evident in classroom practices. A third group of pupils (32.9%), in which boys and higher-achieving pupils were over-represented, were generally satisfied with remote teaching and learning and felt it was comparable to regular classroom practices in terms of educational quality. This segmentation of the student body based on response patterns in their comparison of remote and classroom teaching and learning is useful in demonstrating diverse and nuanced reactions of pupils to newly implemented practices in response to the pandemic. Indeed, by shedding new light onto the complexity of pupil perceptions, these findings have emphasised that such perceptions cannot be simply related to pupil characteristics such as gender and school achievement in a straightforward manner.

This argument is supported by findings arising from our analysis that demonstrated the weak prediction of pupils' level of satisfaction with remote teaching and learning based on a selected set of variables related to individual pupil characteristics. Namely, gender, expected school achievement at the end of 7th grade and perceived competence in using digital devices were not significant predictors of pupils' satisfaction ratings. This is consistent with the findings of other studies recently conducted with older age groups, which did not demonstrate that gender could explain students' experience with e-learning or in ICT activities (e.g. Gunn et al., 2002; McSparran & Young, 2001; Siddiq & Scherer, 2019). However, there are also studies that demonstrate gender gaps in computer experiences and skills that shape opportunities of boys and girls for digital learning (OECD, 2015; European Union, 2019).

On the other hand, research has demonstrated that e-learners should be competent in using ICT (i.e. have high ICT self-efficacy) (e.g. Aesaert & van Braak, 2014) or otherwise risk becoming frustrated when learning in an unconventional online environment and in isolation from others (Wong, 2007). In our sample, most pupils expressed having very high levels of competence in using digital devices, which might explain why this variable was not successful in predicting their level of satisfaction with the implemented practices of remote teaching and learning. Replacing the measure of perceived competence with an indicator of actual performance in using ICT knowledge and skills would likely yield different results.

In contrast to pupils' perceived competence in using digital devices, interest in using computers, mobile phones, tablets etc. was a significant predictor of pupils' level of satisfaction with remote teaching and learning. Arguably, those pu-



pils who previously enjoyed being online and liked conducting activities in an e-environment were also those who were interested in participating in online learning platforms and found remote teaching and learning a satisfactory experience.

The education status of fathers, as an indicator of pupils' social background, was also a significant predictor of pupils' level of satisfaction with remote teaching and learning, where higher parental educational level was associated with a higher level of satisfaction. Although this result cannot explain the underlying mechanisms of this relationship and does not allow insight into details related to gaps in access and pupil experiences related to socio-economic status, it might be assumed that more highly educated parents might provide more assistance in navigating the online learning environment and in completing assignments in specific subjects, and ensure additional learning support if needed. This result confirmed that remote teaching and learning was not exempt from the equity issues already existing in the regular school setting, even in a situation in which all pupils were provided with equal access to the tablets. It might be assumed that, in other generations of pupils who were not provided with free-of-charge tablets, socio-economic differences in educational experiences and outcomes are more substantial.

## CONCLUSION

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To the best of our knowledge, this study is the first examination of the perspectives of upper grades of elementary education (equivalent to lower secondary education) pupils regarding the implementation of remote teaching and learning in Croatia that considers pupils' level of satisfaction with implemented practices and their perception of the quality of these processes. It provides valuable early insights into pupils' perspectives on newly implemented systems of remote teaching and learning during the pandemic. Analyses of pupils' perspectives indicate a complex picture with different patterns of perception of remote teaching and learning among three different groups of pupils. Analytical procedures revealed some of the challenging aspects of the applied practices especially those suggesting the higher workload in the remote setting. In the case of the possible future shifts to remote teaching and learning, educational policy should develop and implement clear and straightforward recommendations to teachers with regard to curricular optimisation and prioritisation as well as procedures for structuring of the pupils' work day in the remote environment. The results indicating that pupils perceive the regular teaching and learning context as one in which the subject content is presented in a more understandable and interesting manner with greater clarity of tasks suggest a sig-

nificant space for the improvement of both the materials and the delivery in the remote teaching and learning context. Educational policy should make a systematic effort in supporting the development of relevant and interesting digital learning materials tailored to the pupils' developmental levels. It is of equal importance to include specific training on teaching and learning practices and delivery in remote environments in both continuous professional development and initial teacher training. The very modest results of the regression model raise important questions for the ongoing exploration of the correlates of pupils' satisfaction and perception regarding remote teaching and learning. Future studies should include measures of parental support, physical home environment and resources for learning as well as various indicators at school level. In addition, it would be interesting to probe if, and in what manner, pupils' personality traits are related to their perception of remote teaching and learning.

## LIMITATIONS OF THE STUDY

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The study presented in this paper examined pupils' perspectives regarding the remote teaching and learning processes implemented in the spring of 2020 without making any distinctions between the various e-course methods and designs applied in individual schools. Because differences in e-course design might influence pupils' level of satisfaction and perceptions regarding remote educational practices, as well as their own learning, future research is necessary to further elaborate the type of e-learning practices used and examine these practices more closely in the context of specific school subjects.

The study is limited to a single generation of pupils, a cohort that was provided with tablets by the state and is in that respect equalised in their access to remote teaching and learning. Furthermore, the findings of the study pertain to a sample representing pupils from Zagreb, the capital of Croatia. It is reasonable to assume that the perceptions and satisfaction of these pupils might diverge from the views of pupils living in less developed communities, where the infrastructural and human resources necessary for organising high quality remote teaching and learning are insufficient.

## NOTES

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<sup>1</sup> No statistical difference was observed between schools for level of pupils' satisfaction with remote teaching and learning ( $F(2,889) = 1.32$ ,  $p = 0.146$ ).

<sup>2</sup> Where 0 means the factor is equally characteristic of classroom and remote teaching and learning. A negative value indicates it is more characteristic of classroom teaching and learning and a positive value more characteristic of remote teaching and learning.

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## Perspektive hrvatskih učenika o nastavi na daljinu tijekom pandemije bolesti COVID-19

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Hrvatska vlada proglasila je 16. ožujka 2020. zatvaranje škola i uvela nastavu na daljinu zbog pandemije COVID-19. U ovom radu istražuju se učeničke perspektive o nastavi na daljinu, koje su primijenjene u 7. razredima osnovnih škola. Cilj je rada utvrditi razinu i odrednice zadovoljstva učenika novim praksama, kao i ispitati doživljaj nastave na daljinu u odnosu na učioničku nastavu. Online-istraživanje sa 920 učenika iz 23 osnovne škole Grada Zagreba provedeno je između 25. svibnja i 6. lipnja 2020. Rezultati upućuju na osrednju razinu zadovoljstva i slabu mogućnost modela za predviđanje učeničkoga zadovoljstva na temelju skupa individualnih obilježja učenika. Interes učenika za upotrebu računalnih uređaja te obrazovni status roditelja jedini su značajni prediktori zadovoljstva. Učenici u prosjeku percipiraju nastavu na daljinu nepovoljnije od nastave u učionicama s obzirom na kvalitetu nastavnoga procesa i opterećenost učenika školskim zadacima. Međutim, postojala je mala skupina učenika (15%), koja je nastavu na daljinu doživljavala kvalitetnijom od nastave u učionicama.

Ključne riječi: usporedba učenja i poučavanja u učionicama i na daljinu, učeničko zadovoljstvo učenjem i poučavanjem na daljinu, obrazovanje tijekom pandemije bolesti COVID-19, predmetna nastava u osnovnoj školi



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